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Lady beetles of Nepal (Coleoptera: Coccinellidae): Coccinellinae from the fields at Nepal Agricultural Research Council, Khumaltar, Lalitpur

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Abstract
The diversity of lady beetle fauna belonging to the subfamily Coccinellinae from Nepal Agricultural Research Council, Khumaltar, Lalitpur is studied in this paper. In total, 14 species from 9 genera (*Calvia*, *Cheilomenes*, *Coccinella*, *Coelophora*, *Harmonia*, *Hippodamia*, *Illeis*, *Oenopia* and *Propylea*) and 1 tribe (Coccinellini) were collected and identified. The identified species were *Calvia quatuordecimguttata* (Linnaeus, 1758), *Cheilomenes sexmaculata* (Fabricius, 1781), *Coccinella septempunctata* Linnaeus, 1758, *Coccinella transversalis* Fabricius, 1781, *Coelophora biplagiata* (Swartz in Schönherr, 1808), *Coelophora bissellata* Mulsant, 1850, *Harmonia sedecimnotata* (Fabricius, 1801), *Hippodamia variegata* (Goeze, 1777), *Illeis confusa* Timberlake, 1943, *Oenopia kirbyi* Mulsant, 1850, *Oenopia mimica* Weise, 1902, *Oenopia quadripunctata* Kapur, 1963, *Propylea dissecta* (Mulsant, 1850) and *Propylea luteopustulata* (Mulsant, 1850).

Keywords: Coccinellinae, ladybird beetles, aphidophagous, biodiversity

1. Introduction
Coccinellidae is a coleopteran family under the superfamily Coccinelloidea. Commonly known as ladybugs, ladybirds, lady beetles or ladybird beetles, they are found in a different range of habitats, including those as diverse as cities, fields, gardens, seacoasts and mountains (Majerus & Kearns, 1989; Hodek & Honek, 1996) [23, 14]. It is the largest family in the superfamily Coccinelloidea, which comprises 360 genera and about 6000 species worldwide (Escalona *et. al*, 2017) [8]. It is found that the individual species within Coccinellidae often show fairly specific habitat requirements (Majerus & Kearns, 1989) [23], so there can be considerable variation in their numbers and species composition between habitats (Hodek, 1973; Elliott & Kieckhefer, 1990; Elliot *et al*., 1991) [15, 6, 7]. Many coccinellids are predators and major biological control agents of hemipteran pests such as aphids, mealy bugs and scale insects, as well as thrips and mites (Moreton, 1969; Hawkeswood, 1987; Majerus, 1994) [27, 13, 24] although not all species of aphids are equally suitable as food for them (Mills, 1981) [25]. Some coccinellids also prey on early instars of Lepidoptera and Coleoptera (Hodek, 1964) [16] while some feed on fungi (Bagal & Trehan, 1945) [2]. From the Indian subcontinent, 36 species of aphidophagous coccinellids have been reported (Agarwala and Ghosh, 1988) [1]. Coccinellinae is a large subfamily under Coccinellidae and an important natural insect pest control agent. They are usually identified by their convex, shiny appearance and distinct color pattern, and by their entomophagous habits (Pope, 1988) [34]. They are linked to biological control more than any other taxon (Obrycki and Kring 1998) [29]. Length varies from 3-11 mm and elytra have external margins usually more or less explanate (Pope, 1988) [34]. However, Epilachninae (which are normally herbivores and sometimes major agricultural pests) have also been merged under Coccinellinae as Epilachnini by Slipinski and Tomaszewska (2010) [38] and Seago *et al*. (2011) [36] based on morphology (Slipinski 2007) [37] and initial molecular analyses by Giorgi *et al*. (2009) [11]. In this study, the older classification is followed and the species of Epilachnini are not included. Within Coccinellinae, the tribe Coccinellini comprises 90 genera and over 1000 species worldwide (Escalona *et. al*, 2017) [8].

Nepal Agricultural Research Council, Khumaltar, Lalitpur is at an altitude of about 1320masl. The vegetation is of deciduous type. Common fruits are citrus, mulberry, guava, papaya, pear, peach etc. Cruciferous vegetables like cabbage, radish, cauliflower, broccoli, mustard, rapeseed etc., cucurbits like cucumber, pumpkin, bitter gourd, bottle gourd, ash gourd etc. and other vegetables like pea, beans, potatoes etc. were found to be grown. Similarly, grasses like rye, oats, dhunche and cereal crops like rice, maize, wheat, barley are grown. The climate is hot and wet during monsoon and cold and dry during winter. The area of NARC, Khumaltar, Lalitpur expands up to 47.2 hectares including 22.40 hectares of the National Animal Science Research Institute.

In Nepal, Hope (1831) [17] made the first effort to record the Coccinellidae in which he described 19 new species. Subsequently, Mulsant (1850) [28] added three and Crotch (1874) [4] added one species later to the list of Hope. Dohrn (1882) [5] later described one more species from Nepal. Kapur (1955) [19] reported 26 species from Nepal of which 5 were new to science and 15 were new to Nepal. Kapur (1963) [20] also enlisted 51 species from Darjeeling, Sikkim and Tibet. Similarly, Miyatake (1985) [26] listed 46 spp. from Nepal Himalayan expedition in 1968. Canepari and Milanese (1997) [3] listed 114 species along with 26 new species from the Himalayas of Nepal. Poorani (2002; 2004; 2012) [31, 32, 33] listed several species from Nepal in her annotated checklist. Joshi and Manadhar (2001) [18] listed

31 species from Nepal. Likewise, Thapa (2000) [39] also listed 31 species. This study is the first initiative to record the lady beetles fauna exclusively from NARC, Khumaltar, Lalitpur. All the species reported in this research have been previously reported from several parts of Nepal.

2. Materials and Methods

The surveys were carried out from June 2018-January 2019 in the pastures of the National Animal Science Research Institute and crop fields at Nepal Agricultural Research Council (Khumaltar, Lalitpur, 27°39'10.7"N 85°19'24.6"E, 1320 masl). The sightings were recorded by capturing photos in Sony Cyber-Shot DSC-HX90V 18.2MP camera. Photos were geotagged with GPS coordinates, elevations and dates. Specimens were collected using sweep nets and hand collection, then stored in glass vials with ethyl acetate-soaked cotton plugs for rapid euthanization. Collected specimens were taken to the Insect Museum Laboratory of Entomology Division (NARC, Khumaltar, Lalitpur). Larvae collected were reared till adults emerged. The adults were dissected under Olympus stereo-microscope Model SZ2-ILST. The stereomicroscope was connected to a Dell Inspiron 3537 laptop installed with Scope Image 9.0 (H1C) software and connected with COSLAB MODEL: MDCE-5C Digital USB Microscope Camera to capture the images under the view. After the dissection, their genitalia were preserved in the microscope slides using Fevicol® glue that became transparent when dried. Detached head, abdomen, and rest of the body were also pasted to the slide. The slides were preserved in a slide box with labels on them. Other adults were mounted on cards using adhesive - Fevicol®, pinned and labeled with data on locality and collection date. They were identified and preserved in a sealed box with naphthalene balls. Thus, the main basis for identification was the observation of the male genitalia.

3. Results and Discussion

A total of 14 species of Coccinellinae belonging to 9 genera from 1 tribe (Coccinellini) were recorded.

1. *Calvia quatuordecimguttata* (Linnaeus, 1758) [22] (Fig. 1)

Material(s) examined

Khumaltar, Lalitpur, 21.ix.2018 ♂; Khumaltar, Lalitpur, 08.x.2018 ♂, Khumaltar, Lalitpur, 08.x.2018 ♀.

Description

The adult beetles 4-4.5mm in length, 2.7-3.4mm in width. Convex hemispherical pink glabrous body. Head and pronotum orange. Pronotum with 2 black spots on the distal part. Numerous black punctations on elytra. Scutellum tiny and orange. A black scutellar spot, a black sutural spot on the postmedian part. Three rounded black spots on each elytron in 1-2-1 fashion. Elytral margins pale. Venter brownish. Meso-, metasternum and median of I, II, III abdominal sternite fuscous. Legs the same color as the rest of the venter.

Distribution

Azerbaijan, Albania, Andorra, Armenia, Austria, Belgium, Bosnia Herzegovina, Bulgaria, Belarus, Croatia, Russia, Czech Republic, Denmark, Estonia, Finland, France. Great Britain, Germany, Georgia, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, The Netherlands, Macedavia, Moldavia, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden (Kovar 2007) [21]; India (West Bengal), Bhutan, Nepal (Poorani 2012) [33].

Host plants/Hosts

It was found on mulberry and pomelo trees feeding on psyllids and aphids.

2. *Cheilomenes sexmaculata* (Fabricius, 1781) [9] (Fig. 2)

Material(s) examined

Khumaltar, Lalitpur, 08.x.2018 ♂; Khumaltar, Lalitpur, 09.x.2018 ♂; Khumaltar, Lalitpur, 09.x.2018 ♀.

Description

Size from 3.9-5.1mm length and 3-3.5mm width. Males much smaller than females. Oval convex glabrous body. Three forms were found. The pronotum of all three forms similar i.e. ochraceous with a T-shaped median marking connected to a broad black band along the posterior margin. One form was typical with orange to pinkish elytra, two black wavy bands and a subapical roundish spot on each elytron. Venter and legs ochraceous. The second form had orangish elytra with a huge black portion covering almost all of it except at the margins and a circular region at the postmedian discs. Prosternum, mesosternum and abdomen browner. Two black spots in the center part of the elytral epipleuron. The third form had elytra entirely black. Pronotal epipleuron pale yellowish, except at the base. Sternums fuscous. First 3 abdominal sternites fuscous, other brown. Legs black with brownish mix. Coxae, tips of tibiae, tarsi and claws brownish. Forelegs mostly brownish, ventral femurs fuscous.

Distribution

Arab Emirates, Afghanistan, Bhutan, Hongkong, China (Fujian, Gansu, Guandong, Guizhou, Guangxi, Hainan, Henan, Hubei, Hunan, Jiangsu, Jilin, Jiangxi, Liaoning, Sichuan, Shaanxi, Shanghai, Yunnan, Zhegiang), Nepal, Oman. Pakistan (Kovar 2007) [21]; Throughout India, Bangladesh, Sri Lanka, Myanmar, Malaysia, Indonesia, the Philippines, Vietnam, Japan, Australia (Poorani 2012) [33].

Host plants/Hosts

It was found on *Bidens pilosa*, marigold and potatoes feeding on aphids.

3. *Coccinella septempunctata* Linnaeus, 1758 [22] (Fig. 3)

Material(s) examined

Khumaltar, Lalitpur, 08.vii.2018 ♂; Khumaltar, Lalitpur, 09.vii.2018; Khumaltar, Lalitpur, 12.vii.2018 ♀; Khumaltar, Lalitpur, 12.vii.2018 ♂.

Description

Size from 6-8mm in length and 4-5mm in width. Color orange to bright red. Three forms were found. One was typical with small 7 spots, the other had larger or bolder spots which is named as var. *bruckii*. The other forms had spots confluent to each other named generally as var. *confusa*. Venter all black. Mesosternal epimeron white.

Distribution

All over India, Pakistan, Sri Lanka, Palaearctic, North America (Poorani 2012) [33].

Host plants/Hosts

They were found on *Ageratum* spp., *Bidens pilosa*,

marigold, eggplant, rice and various other vegetables feeding on aphids. It was the most common of all species and also found throughout the year.

4. *Coccinella transversalis* Fabricius, 1781 [9] (Fig. 4)
Material(s) examined
Khumaltar, Lalitpur, 08.vii.2018 ♂; Khumaltar, Lalitpur, 16.viii.2018 ♂; Khumaltar, Lalitpur, 08.ix. 2018 ♀.

Description
Size from 5.5-5.9mm in length and 3.1-3.4mm in breadth. Color bright red to pale orange. Black head with 2 orange spots on each side. Eyes black. Black pronotum the anterolateral parts of which have an orange section. Scutellum black. A black line passes through the suture which enlarges immediately about a millimeter below the pronotum. Three curved black lines on each elytron. The first line longer and heavily curved. Middle one moderately curved. None of them reach the margin of the elytra, while the posterior one fully reaches the margin of the elytra. Venter and legs black.

Distribution
Bhutan, Taiwan, China (Fujian, Guandong, Hainan, Yunnan) (Kovar 2007) [21]; India, Nepal, Sri Lanka, Bangladesh, Indochina, Indonesia, Japan, Australia, New Zealand (Poorani 2012) [33].

Host plants/Hosts
They were found on marigold, eggplant, rice and various other vegetables feeding on aphids mostly along with *C. septempunctata*. Some were found on *Galinsoga parviflora* near ground level along with *Propylea luteopustulata* and *P. dissecta*.

5. *Coelophora biplagiata* (Swartz in Schönherr, 1808) [35] (Fig. 5)
Material(s) examined
Khumaltar, Lalitpur, 06.x.2018 ♂; Khumaltar, Lalitpur, 14.x.2018 ♂; Khumaltar, Lalitpur, 14.x.2018 ♀.

Description
A black-colored beetle about 8.1mm in length and 5.6mm in width. Dome-shaped glabrous body. Shiny black in color. Head completely black in females, base black and apex creamy white in males. Clypeus pubescent. Pronotum with two creamy white subtrapezoidal spots, one on each side. A carmine mark on the median disc of each elytron from subrounded to thin and fairly long. While sometimes these marks seem as if two separate marks have been confluent into one, sometimes they are even slightly separate. Even punctations on the pronotum and elytra except on the apex of the scutellum. Explanate elytral margins. Venter pubescent and black. Posterior metasternum non-pubescent. Tarsi and claws testaceous. Margins of abdominal sternites testaceous.

Distribution
South Korea, Nepal, Japan, Taiwan, Hongkong, China (Fujian, Guangxi, Hainan, Jiangxi, Xizang, Yunnan, Zhejiang (Kovar 2007) [21]; India, Myanmar, Indochina, Indonesia (Poorani 2012) [33].

Host plants/Hosts
It was abundantly found on *Bidens pilosa* feeding on aphids. A very small number was also found on the plants of *Thuja compacta* and *Prunus persicae*.

6. *Coelophora bissellata* Mulsant, 1850 [28] (Fig. 6)
Material(s) examined
Khumaltar, Lalitpur, 28.ix.2018 ♂; Khumaltar, Lalitpur, 02.x.2018 ♂.

Description
About 4.3-5.4mm in length and 3.5-4mm in width. Dome-shaped glabrous, pale orange body. Head ochraceous. Eyes black. Pronotum ochraceous with 4 spots. Two tiny black spots on the posterior angle of the pronotum, one on each side, and 2 larger black spots on the center posterior pronotum separated in the line of suture (sometimes these two spots are confluent). Elytra with 4 black spots on each and 2 on suture, one at anterior and one at posterior suture. Prominent punctures in the lines of the sutural and basal margins of the elytron. Explanate elytral margins. Sternums and median of abdominal sternites fuscous. Prosternal epipleuron ochraceous except basal tip which is fuscous, elytral epipleron ochraceous except a small fuscous part at the center. Coxae, trochanters and femora bases of hind legs fuscous.
The second form was rather spotless and lacked such spots on the elytra and had a longitudinal black spot on the anterior half of the suture about 0.8mm long. Two small black spots toward the margin of each elytron the shade of which is also seen in the epipleuron.

Distribution
Bhutan, Taiwan, China (Fujian, Guandong, Guizhou, Guangxi, Hainan, Hebei, Jiangxi, Sichuan, Xizang, Yunnan), Nepal, South Korea (Kovar 2007) [21]; India (Karnataka, Tamil Nadu, Assam, Manipur, Sikkim, Uttar Pradesh, Meghalaya, Himanchal Pradesh, Kerala, West Bengal), Bangladesh, Thailand, Vietnam, Sumatra, The Philippines, New Guinea (Poorani 2012) [33].

Host plants/Hosts
It was found on the plants of *Bidens pilosa* feeding on aphids. The population density was relatively low.

7. *Harmonia sedecimnotata* (Fabricius, 1801) [10] (Fig. 7)
Material(s) examined
Khumaltar, Lalitpur, 11.x.2018 ♂, Khumaltar, Lalitpur, 01.xi.2018 ♀.

Description
About 4.9mm in length and 3.2mm in width. A dome-shaped pale yellow glabrous body with maximum convexity in the middle. Head same color as body. Eyes black. Base of the pronotum has 2 black spots. Each elytron has 8 black spots in 2-3-2-1 fashion from base to apex. A black scutellar spot present. Venter all brownish.

Distribution
Taiwan, Hongkong, China (Fujian, Guandong, Guizhou, Guangxi, Hainan, Hunan, Jiangxi, Suchuan, Yunnan, Xizang, Zhejiang) (Kovar 2007) [21]; India (West Bengal, Sikkim), Nepal, Southeast Asia (Poorani 2012) [33].

Host plants/Hosts
It was very rare and was found on plants of *Bidens pilosa* feeding on aphids.

8. *Hippodamia variegata* (Goeze, 1777) [12] (Fig. 8)
Material(s) examined
Khumaltar, Lalitpur, 10.vii.2018 ♂; Khumaltar, Lalitpur, 20.ix.2018 ♀; Khumaltar, Lalitpur, 11.x.2018 ♂.

Description
Size about 4 to 5.5mm in length and 3 to 3.5mm in width. Oval-shaped elongated glabrous body, slightly convex. Head apex black, basal 2/3rd black and creamy white in the middle. Pronotum white with a mask-like huge black patch in the middle. Elytra color ranges from red to orange. Pattern of black bands on elytra varies. Venter black. Pronotal epipleuron creamy white. All sternal epimera white. Legs densely pubescent, black with brownish tinge on femurs, tibiae, tarsi. Claws black.

Distribution
Azerbaijan, Albania, Andorra, Armenia, Austria, Belgium, Bsonia Herzegovina, Bulgaria, Belarus, Croatia, Russia (Central European Territory, North European Territory, West Serbia, Far East, South European Territory) Czech Republic, Denmark, Estonia, Finland, France, Great Britain, Germany, Georgia, Greece, Hungary, Italy, Latvia, Liechtenstein, Lithuania, Luxemburg, Macedonia, Moldavia, The Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, Serbia and Montenegro, Algeria, Canary Islands, Egypt, Libya, Morocco, Madeira, Archipelago, Tunisia, Arab Emirates, Afghanistan, Bhutan, China (Fujian, Gansu, Hebei, Henan, Hunan, Liaoning, Jilin, Nei Mongol, Ningxia, Sichuan, Shaanxi Shandong, Xinjiang, Xizang, Yunnan) Iraq, Israel, Jordan, Kyrgyzstan, Kazakhstan, Lebanon, Mongolia, North Korea, Nepal, Pakistan, Saudi Arabia, South Korea, Syna, Tajikistan, Turkmenistan, Turkey, Uzbekistan, Yemen (Kovar 2007) [21]; India (Jammu and Kashmir, Uttar Pradesh, Himanchal Predesh, Maharashtra), Nepal, Pakistan, Tibet, Mongolia, Northern and eastern Africa, Palaearctic (Poorani 2012) [33].

Host plants/Hosts
They were found on the plants of *Elusine indica*, *Oryza sativa*, *Bidens pilosa*, marigold and eggplant feeding on aphids. More abundant during July-August on *Elusine indica*, although seen throughout the year in small numbers.

9. *Illeis confusa* Timberlake, 1943 [40] (Fig. 9)
Material(s) examined
Khumaltar, Lalitpur, 04.vii.2018 ♂; Khumaltar, Lalitpur, 22.viii.2018 ♂; Khumaltar, Lalitpur, 09.ix.2018 ♂.

Description
Size from 3.8-4.2mm in length and 2.4-3mm in width. Oblong hemispherical glabrous cream-colored body relatively softer than other Coccinellinae. Eyes black. Two black spots on the distal pronotum. Plain elytra with minor punctations. Orange brownish venter.

Distribution
India (Assam), Nepal, Thailand, China, Hong Kong (Poorani 2012) [33].

Host plants/Hosts
It was abundantly found on the plants of mulberry feeding on fungi.

10. *Oenopia kirbyi* Mulsant, 1850 [28] (Fig. 10)
Material(s) examined
Khumaltar, Lalitpur, 08.x.2018 ♀; Khumaltar, Lalitpur, 16.xii.2018 ♀.

Description
Only 2 female specimens were found. Size of one was 3.2mm in length and 2.2mm in width and of the others was 3.1 mm in length and 2mm in breadth. Subcircular glabrous lemon-colored body. Black head. Sparse punctures on body. Black pronotum with pale yellow subtrapezoidal patches on either anterolateral sides which don't reach to the posterior angles, i.e. the basal margins of the black part touch the posterior angles. Margins of elytra have a black band surrounding it. A black sutural line runs across the base to apex that slightly thickens in the middle. Two large subrounded spots on each elytron on the basal and apical half. Venter black. Legs black except tips of femur, tibiae, tarsi and claws. Pronotal epipleuron base black, remaining creamy white.

Distribution
India (Meghalaya, West Bengal, Maharashtra, Jammu and Kashmir, Uttar Pradesh, Sikkim), China, Thailand, Myanmar (Poorani 2012) [33].

Host plants/Hosts
It was found in small numbers, feeding on aphids on *Bidens pilosa*, co-occurring with *O. mimica*.

11. *Oenopia mimica* Weise, 1902 [41] (Fig. 11)
Material(s) examined
Khumaltar, Lalitpur, 10.x.2018 ♂; Khumaltar, Lalitpur, 11.x.2018 ♂.

Description
Size about 3.4-4mm in length and 2-2.6mm in width. Subcircular glabrous lemon-colored body. Head anterior pale yellow posterior half black. Eyes black. Pronotum same as that of *Oenopia kirbyi* except that the basal margins of the black part almost reach, but do not touch the posterior angles. Elytra with feeble punctations. 2 subrounded black spots on each elytron. An oval sutural spot in median and subrounded sutural spot in subapical part. Venter black. Fore and midlegs testaceous. Hindfemurs black except on apices and base. Elytral epipleuon lemon colored. Pronotal epipleuron creamy white with base fuscous.

Distribution
India (Sikkim, Himanchal Pradesh, Uttar Pradesh), Nepal (Poorani 2012) [33].

Host plants/Hosts
It was found on aphids on *Bidens pilosa* and *Artemisia vulgaris*.

12. *Oenopia quadripunctata* Kapur, 1963 [20] (Fig. 12)
Material(s) examined
Khumaltar, Lalitpur, 01.x.2018 ♂; Khumaltar, Lalitpur, 09.x.2018 ♂.

Description
Size about 3.4-4.5 mm in length and 2-3 mm in width. Convex hemispherical glabrous black body. Pronotum black with two pale yellow subtrapezoidal spots on lateral

margins. Minor punctations. Elytra black with 2 pale yellow spots on each elytron, one at anterior and one at posterior disc. Two semicircular spots on the margins are merged to the pale-yellow lining on the margin. Elytral and pronotal epiplueron pale yellow. Venter black. Legs brownish except below the apices of femurs.
Another form, a rather rare one, with a similar pronotum design had elytra completely black with pale yellow margins.

Distribution
China (Hubei Jiangsu Xizang Yunnan) (Kovar 2007) [21]; India (Meghalaya, West Bengal, Sikkim, Assam, Maharashtra), Bhutan, Myanmar (Poorani 2012) [33].

Host plants/Hosts
It was found on mulberry plants along with *Illeis confusa* but in fewer numbers. It was probably feeding on fungi too.

13. *Propylea dissecta* (Mulsant, 1850) [28] (Fig. 13)
Material(s) examined
Khumaltar, Lalitpur, 08.x.2018 ♂; Khumaltar, Lalitpur, 11.x.2018 ♂.

Description
Size from 3.4-4mm in length to 2.3-2.9mm in width. Oval glabrous body. Head anterior part creamy white with two blackish spots at the tip and the basal part black. Creamy white pronotum with a huge black band at the base not quite reaching the lateral margins. Pale yellow elytra with two bold curvy black transverse lines on each. A black line passes through the suture. A sutural black spot at the apical end of the elytra. Pronotum epipleuron creamy white. Sternums and median of abdominal sternites fuscous. Forelegs brownish, midlegs and hindlegs brownish with fuscous around apices of femurs and below. In second form, oval convex glabrous body. Pronotum black with wavy white area around lateral margins. Elytron orange with inner basal portion creamy white. A longitudinal black line passes through the length of this creamy white portion. Two black spots on each elytron, one comet shape just behind the creamy part in the basal half and one subrounded in the apical half.

Distribution
China (Shanghai) (Kovar 2007) [21]; India (Assam, Tamil Nadu, Karnataka, Uttar Pradesh), Bangladesh, Nepal (Poorani 2012) [33].

Host plants/Hosts
It was found on *Bidens pilosa* and other weeds feeding on aphids along with *Propylea luteopustulata.*

14. *Propylea luteopustulata* (Mulsant, 1850) [28] (Fig. 14)
Material(s) examined
Khumaltar, Lalitpur, 08.vii.2018 ♂; Khumaltar, Lalitpur, 16.viii.2018 ♂; Khumaltar, Lalitpur, 2018.ix.07 ♂; Khumaltar, Lalitpur, 2018.ix.08 ♂; Khumaltar, Lalitpur, 2018.x.10 ♂.

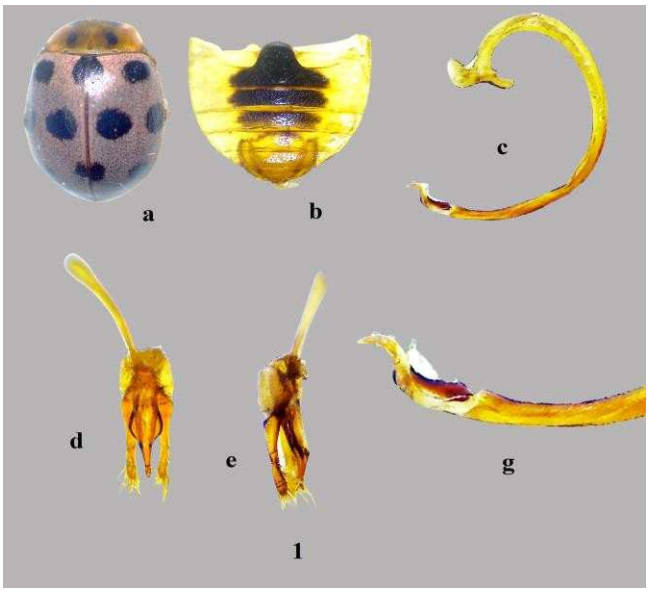
Description
Length about 5-5.3mm and width about 3.8-4.1mm. Found in at least 10 forms (Fig. 14).

Comment
One of the male individuals was found mating with a female of *Coelophora biplagiata* for several minutes (Fig 15).

Distribution
Taiwan, China (Anhui, Fujian, Guandong, Guizhou, Guangxi, Henan, Hubei, Hunan, Jiangxi, Shaanx,i Sichuan, Xizang, Yunnan) (Kovar 2007) [21]; India (Assam, West Bengal, Sikkim, Meghalaya, Uttar Pradesh, Himanchal Pradesh, Andaman and Nicobar Islands?), Nepal, Bhutan, Sri Lanka, Myanmar, Vietnam, Thailand, Tibet, (Poorani 2012) [33].

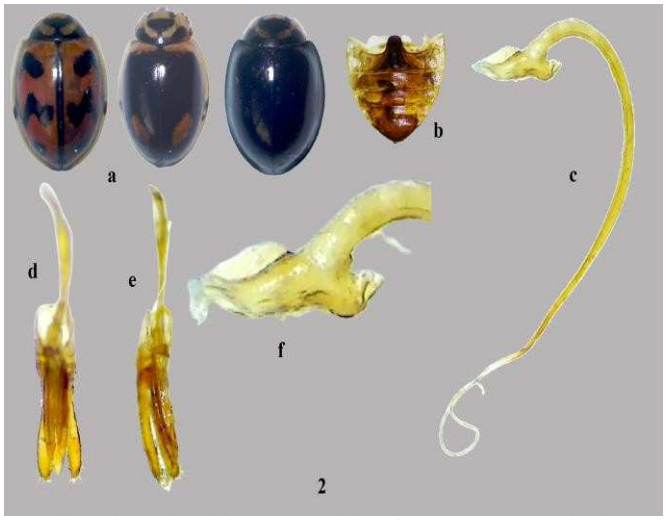
Host plants/Hosts
It was found on *Bidens pilosa*, *Galinsoga parviflora* and other small weeds feeding on aphids.

4. Figures of Habitus and Male Genitalia of Each Studied Species



a. Habitus, b. Male Abdomen, c. Sipho, d. Tegmen, Ventral View, e. Tegmen, Lateral View, g. Sipho Apex

Fig 1: *Calvia quatuordecimguttata* (Linnaeus, 1758) [22]

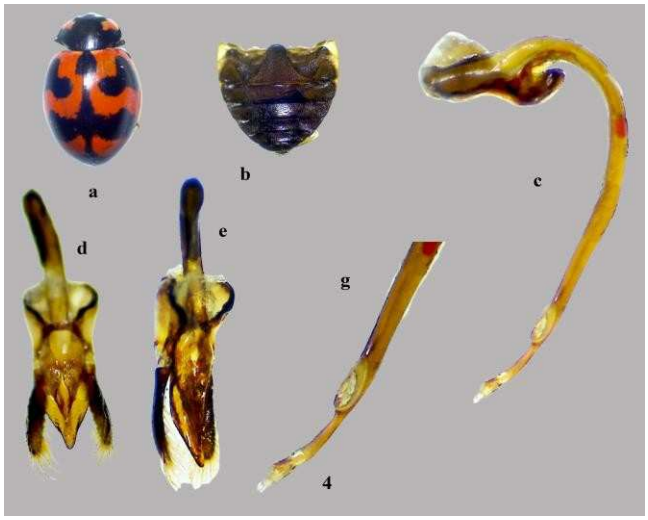


a. Habitus, b. Male Abdomen, c. Sipho, d. Tegmen, Ventral View, e. Tegmen, Lateral View, f. Sipho Capsule

Fig 2: *Cheilomenes sexmaculata* (Fabricius, 1781) [9]

a. Habitus, b. Male Abdomen, c. Sipho, d. Tegmen, Ventral View, f. Sipho Capsule, g. Sipho Apex

Fig 3: *Coccinella septempunctata* Linnaeus, 1758 [22]



a. Habitus, b. Male Abdomen, c. Sipho, d. Tegmen, Ventral View, e. Tegmen, Lateral View, g. Sipho Apex

Fig 4: *Coccinella transversalis* Fabricius, 1781 [9]

a. Habitus, b. Male Abdomen, c. Sipho, d. Tegmen, Ventral View e. Tegmen, Lateral View, f. Sipho Capsule, g. Sipho Apex

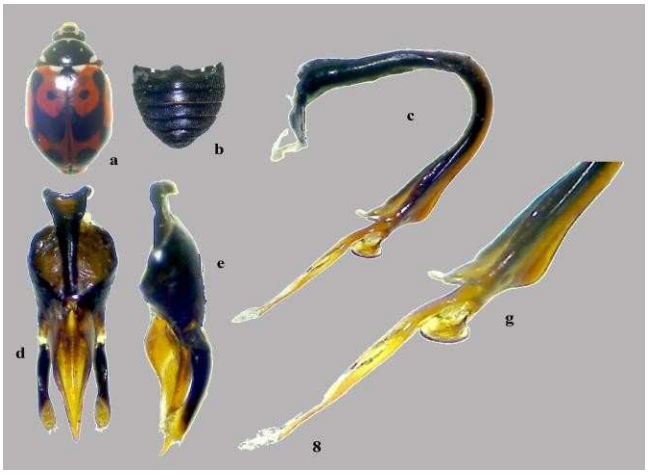
Fig 5: *Coelophora biplagiata* (Swartz in Schönherr, 1808) [35]

a. Habitus, b. Male Abdomen, c. Sipho, d. Tegmen, Ventral View e. Tegmen, Lateral View, f. Sipho Capsule, g. Sipho Apex

Fig 6: *Coelophora bissellata* Mulsant, 1850 [28]

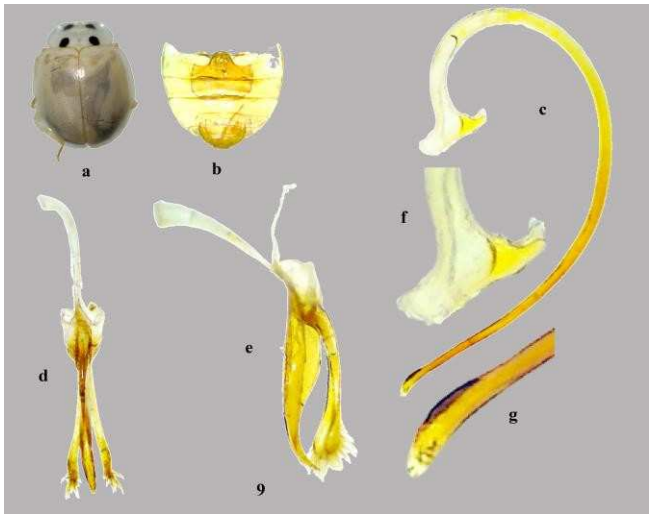
a. Habitus, b. Male Abdomen, c. Sipho, d. Tegmen, Ventral View, e. Tegmen, Lateral View, f. Sipho Capsule, g. Sipho Apex

Fig 7: *Harmonia sedecimnotata* (Fabricius, 1801) [10]



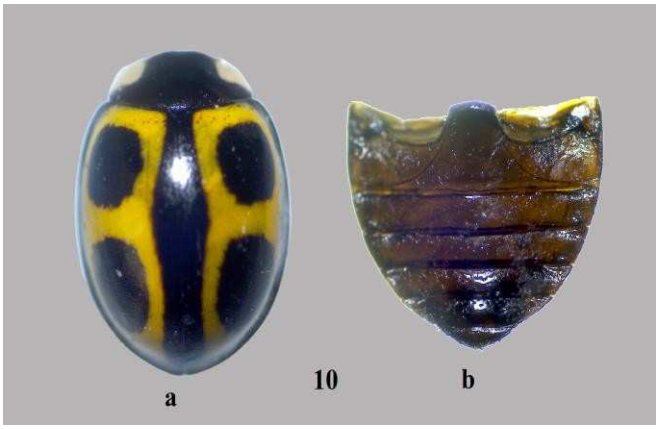
a. Habitus, b. Male Abdomen, c. Sipho, d. Tegmen, Ventral View, e. Tegmen, Lateral View, g. Sipho Apex

Fig 8: *Hippodamia variegata* (Goeze, 1777) [12]



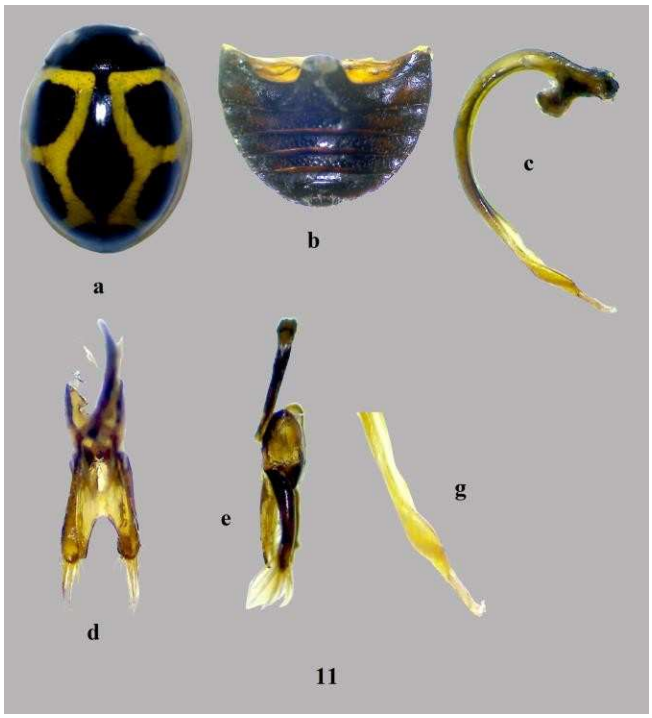
a. Habitus, b. Male Abdomen, c. Sipho, d. Tegmen, Ventral View, e. Tegmen, Lateral View, f. Sipho Capsule, g. Sipho Apex

Fig 9: *Illeis confusa* Timberlake, 1943 [40]



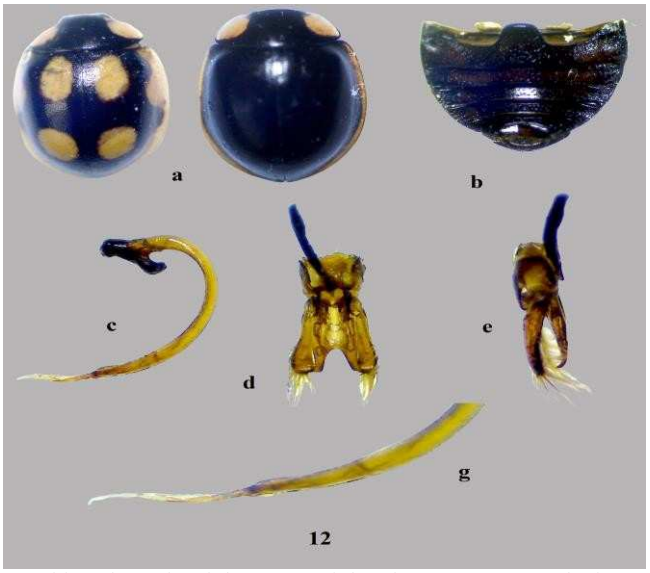
a. Habitus, b. Female Abdomen

Fig 10: *Oenopia kirbyi* Mulsant, 1850 [28]



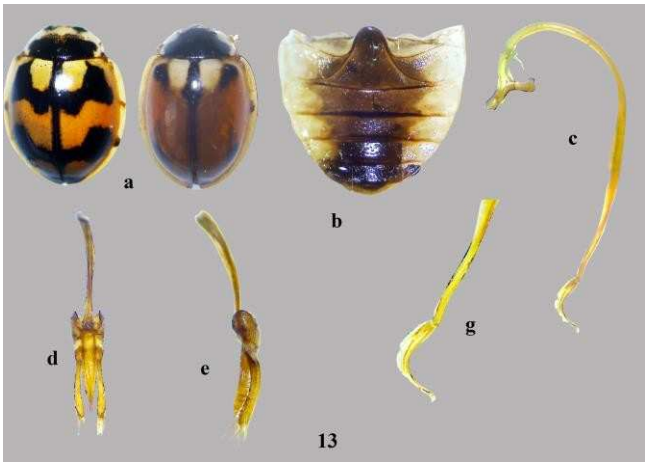
a. Habitus, b. Male Abdomen, c. Sipho, d. Tegmen, Ventral View, e. Tegmen, Lateral View, g. Sipho Apex

Fig 11: *Oenopia mimica* Weise, 1902 [41]



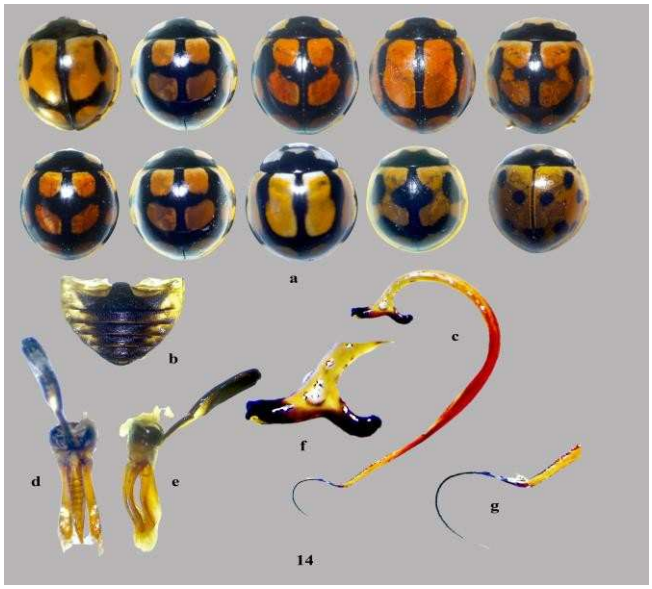
a. Habitus, b. Male Abdomen, c. Sipho, d. Tegmen, Ventral View, e. Tegmen, Lateral View g. Sipho Apex

Fig 12: *Oenopia quadripunctata* Kapur, 1963 [20]



a. Habitus, b. Male Abdomen, c. Sipho, d. Tegmen, Ventral View, e. Tegmen, Lateral View, g. Sipho Apex

Fig 13: *Propylea dissecta* (Mulsant, 1850) [28]



a. Habitus, b. Male Abdomen, c. Sipho, d. Tegmen, Ventral View, e. Tegmen, Lateral View, f. Sipho Capsule, g. Sipho Apex

Fig 14: *Propylea luteopustulata* (Mulsant, 1850) [28].

Fig 15: Interspecific mating between *Propylea luteopustulata* ♂ and *Coelophora biplagiata* ♀

4. Conclusion

Fourteen species of Coccinellinae belonging to 9 different genera and 1 tribe (Coccinellini) were collected and identified in this study. They were *Calvia quatuordecimguttata* (Linnaeus, 1758) [22], *Cheilomenes sexmaculata* (Fabricius, 1781) [9], *Coccinella septempunctata* Linnaeus, 1758 [22], *Coccinella transversalis* Fabricius, 1781 [9], *Coelophora biplagiata* (Swartz in Schönherr, 1808) [35], *Coelophora bissellata* Mulsant, 1850 [28], *Harmonia sedecimnotata* (Fabricius, 1801) [10], *Hippodamia variegata* (Goeze, 1777) [12], *Illeis confusa* Timberlake, 1943 [40], *Oenopia kirbyi* Mulsant, 1850, *Oenopia mimica* Weise, 1902 [41], *Oenopia quadripunctata* Kapur, 1963 [20], *Propylea dissecta* (Mulsant, 1850) [28] and *Propylea luteopustulata* (Mulsant, 1850) [28]. All of these species have been studied from Nepal in earlier literature and no species new to science or new to Nepal have been reported in this study.

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